CLAIMS

What is claimed is:

1. A method of setting visualization parameter boundaries for displaying an image from a 3D data set comprising a plurality of voxels, each with an associated signal value, comprising:

selecting a volume of interest (VOI) within the 3D data set;

generating a histogram of signal values from voxels that are within the VOI;

applying a numerical analysis method to the histogram to determine a visualization threshold; and

setting at least one of a plurality of boundaries for a visualization parameter according to the visualization threshold.

2. The method of claim 1, wherein a first visualization parameter boundary is set at the visualization threshold.

3. The method of claim 1, wherein first and second visualization parameter boundaries are set either side of the visualization threshold.

4. The method of claim 1, wherein the numerical analysis method is applied iteratively to the histogram to determine a plurality of visualization thresholds and corresponding visualization parameter boundaries.

5. The method of claim 1, further comprising applying a significance test to visualization thresholds and, according to the outcome of the significance test, ascribing a significance marker for those ones of the voxels having signal values at or adjacent to the visualization threshold, wherein the significance marker indicates significance or insignificance of the visualization threshold.

6. The method of claim 5, further comprising applying a selection tool to the 3D data set, wherein the selection tool is sensitive to the significance markers.

7. The method of claim 6, wherein the selection tool ignores visualization parameter boundaries that have been marked as insignificant.

8. The method of claim 1, wherein the numerical analysis method comprises:

forming a convex hull of a plurality of segments around the histogram;

determining which perpendicular from the segment to the histogram has the greatest length; and

taking the signal value at the intersection between the histogram and the perpendicular as the visualization threshold.

9. The method of claim 1, wherein the numerical analysis method comprises:

forming a convex hull of a plurality of segments around the histogram;

determining which perpendicular from the segment to the histogram has the greatest length; and

taking the signal value at the intersection between the histogram and the perpendicular as the visualization threshold, wherein the method further comprises:

applying a significance test based on the length of the perpendicular determined to have the greatest length to the visualization threshold and, according to the outcome of the significance test, ascribing a significance marker for those ones of the voxels having signal values at or adjacent to the visualization threshold, wherein the significance marker indicates significance or insignificance of the visualization threshold.

10. The method of claim 9, wherein the visualization threshold is determined to be insignificant if the ratio of the length of the perpendicular to a parameter derived from

the signal value range and/or the frequency range of the histogram is below a minimum score.

11. The method of claim 1, wherein the numerical analysis method is applied to the histogram within a predetermined restricted range of signal values to search for a visualization threshold within that restricted range.

12. The method of claim 11, wherein the restricted range is defined in terms of Hounsfield units.

13. The method of claim 1, further comprising displaying to a user the histogram and its visualization parameter boundaries together with the image created from the 3D data set, so that the user is made aware of the visualization parameter boundaries.

14. The method of claim 1, wherein the histogram is restricted to un-sculpted voxels in the VOI.

15. The method of claim 1, wherein voxels with the highest and/or the lowest signal values are excluded from the numerical analysis method.

16. The method of claim 1, wherein the visualization parameter is color.

17. The method of claim 1, wherein the visualization parameter is opacity.

18. The method of claim 1, wherein the visualization parameter is rate of change of color with signal value.

19. The method of claim 1, wherein the visualization parameter is rate of change of opacity with signal value.

20. The method of claim 1, wherein the visualization parameter is segmentation information.

21. The method of claim 1, wherein the 3D data set is a medical imaging data set.

22. The method of claim 1, further comprising selecting a sub-set of voxels within the 3D data set, wherein the step of selecting a sub-set of voxels is based upon the visualization parameter boundaries.

23. The method of claim 1, further comprising generating a second histogram of signal values from all of the voxels that are within the 3D data set.

24. The method of claim 23, wherein a display of the second histogram is provided on a visual display unit

25. A computer program product bearing computer readable instructions for performing the method of claims 1.

26. A computer apparatus loaded with computer readable instructions for performing the method of claims 1.